

**Geometry Date\_\_\_\_\_ 2.4 Notes: Reasoning from Algebra**  
**(pp 96-98)**

**Work with the person sitting next to you. Stay in your seat! The steps to solve the equation  $10y + 5 = 25$  are given below. Rewrite the steps in the correct order. Next to each step, describe what happens in that step.**

$$10y + 5 - 5 = 25 - 5$$

$$y = 2$$

$$10y = 20$$

$$\frac{10y}{10} = \frac{20}{10}$$

$$10y + 5 = 25$$

**B. The steps to solve the equation  $6x + 3 = 9(x - 1)$  are given below. Put the steps in the correct order. Next to each step, describe what happens in that step.**

$$-3x + 3 = -9$$

$$6x + 3 = 9x - 9$$

$$-3x = -12$$

$$6x + 3 = 9(x - 1)$$

$$\frac{-3x}{-3} = \frac{-12}{-3}$$

$$6x - 9x + 3 = 9x - 9x - 9$$

$$x = 4$$

$$-3x + 3 - 3 = -9 - 3$$

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## **2.4 Notes: Reasoning from Algebra**

**Addition, Subtraction, Multiplication, & Division Properties of Equality:**

**Reflexive Property:**

**Symmetric Property:**

**Transitive Property:**

**Substitution Property:**

### **Examples**

**1. Solve  $3x + 12 = 8x - 18$  and write a reason for each step.**

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**A child's dose  $c$  for a medicine with an adult dose of 500 mg can be found by using the child's age  $a$  in years in the formula  $a = \frac{24}{500}c - 1$ .**

**2. Solve the formula for  $c$  and write a reason for each step.**

**3. Find the child's dosage for an 8-year-old.**

**Guided Practice: The formula to convert Fahrenheit to Celsius is**

$$C = \frac{5}{9}(F - 32).$$

**4. Solve the formula for  $F$  and write the reason for each step.**

**5. Find the Fahrenheit temperature at  $24^{\circ}\text{C}$ .**

**Examples**

5.  $AC = BD$ . Verify that  $AB = CD$ .

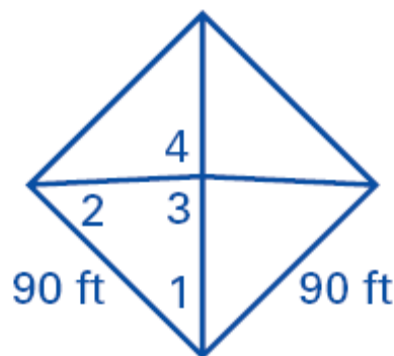


6. A baseball mound is shown. The pitcher's mound is at  $\angle 3$ . Find  $m\angle 4$ .

$$m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$$

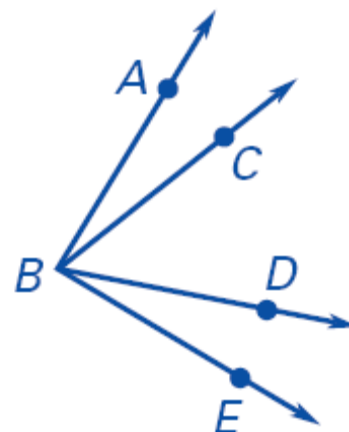
$$m\angle 1 + m\angle 2 = 93^\circ$$

$$m\angle 3 + m\angle 4 = 180^\circ$$



**Guided Practice**

7.  $\angle mABC = m\angle DBE$ . Show that  $m\angle ABD = m\angle CBE$ .



8. \_\_\_\_\_ What property would you use to solve  $\frac{x}{5} = -2$ ?

- A. Addition of Property of equality.
- B. Subtraction Property of equality.
- C. Multiplicaiton Properyt of equality.
- D. Substitution Property
- E. Reflexive Property.

9. Name the property tha makes the following statement true: If  $\angle 3 = m\angle 5$ , then  $m\angle 5 = m\angle 3$ .

Match the property with the statement.

	Statement	Reason
10. _____	If $JK = PQ$ and $PQ = ST$ , then $JK = ST$ .	A. Addition Properyt of equality
11. _____	If $m\angle S = 30^\circ$ , then $5^\circ + m\angle S = 35^\circ$	B. Substituion Property.
12. _____	If $ST = 2$ and $SU = ST + 3$ , then $SU = 5$ .	C. Transitive Property.
13. _____	If $m\angle K = 45^\circ$ , then $3(m\angle K) = 135^\circ$ .	D. Symmetric Property
14. _____	If $m\angle P = m\angle Q$ , then $m\angle Q = m\angle P$ .	E. Multiplication Property of Equality.